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EXAMINER	
NGUYEN, TAM M	

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 20040304

Application Number: 10/042,056
Filing Date: January 10, 2002
Appellant(s): LESIEUR ET AL.

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William W. Jones
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed September 29, 2003.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The brief does not contain a statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief. Therefore, it is presumed that there are none. The Board, however, may exercise its discretion to require an explicit statement as to the existence of any related appeals and interferences.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

The rejection of claims 1-8 stand or fall together, claims 9, 10, and 11 stand or fall by itself, claims 20-21 stand or fall together, and claims 22-25 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

3,485,746	Setzer et al.	12-1969
6,103,103	Alexander et al.	08-2000

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-8 and 20-25 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Setzer et al.(3,485,746).

Applicants are claiming several methods for desulfurizing a feed which involve processing an oxygenate containing feed over a nickel desulfurization station.

The reference of Setzer et al.(3,485,746) discloses a process for desulfurizing a hydrocarbon fuel containing organic sulfur compounds such as thiophenes and mercaptans for use in a fuel cell. See column 1, lines 20-25 and column 2, lines 35-43. The disclosed process is suitable for processes that are affected by trace amounts of sulfur. See column 1, lines 22-23. The process involves adding water (steam) to a fuel and contacting the water containing fuel with nickel metal. See Fig.1, page 1, column 1, lines 62-66. The desulfurization is conducted at a temperature of 500-900°F. See column 1, lines 69-70. The nickel bed is converted to nickel sulfide. See column 3, lines 26-29. The reference further teaches that it is thought that oxygen from the steam forms a protective layer on the nickel particles, thereby preventing undesirable coke formation in the bed. See column 3, lines 32-45.

The reference of Setzer et al.(3,485,746) succeeds in disclosing a process for desulfurizing a fuel suitable for use in fuel cells. The reference succeeds at disclosing the addition of an oxygenate in the form of water. In addition, the reference succeeds in disclosing a nickel reactant-absorbent for converting organic sulfur compounds to nickel sulfide which is considered to correspond to applicants' desulfurization station.

Several differences are noted between the reference of Setzer et al.(3,485,746) and applicants' claimed invention. The reference is silent about the process effluent containing less than 0.05 ppm sulfur. The reference does not disclose maintaining the desulfurization station (nickel bed) at a temperature in the range of 300-450°F. The reference is also silent about the recirculating of water. The reference is silent about the processing of the specific gaseous feed claimed by applicants.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to desulfurize the Setzer et al.(3,485,746) fuel to any degree required to produce a suitable fuel cell feed, including applicants' less than 0.05 ppm sulfur, because the reference discloses that the method is desirable for sensitive processes which are affected by trace quantities of sulfur. It is within the level of ordinary skill to practice a known desulfurization process to attain a desired level of desulfurization.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to accomplish the desulfurization of Setzer et al.(3,485,746) at a temperature of 450°F because the prior art range is close enough that one skilled in the art would have expected it to have the same conversion properties including sulfur removal ability. Applicants have not shown anything unexpected with respect to the claimed temperatures.

In addition, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize water obtained from any source in Setzer et al.(3,485,746), including a recycle from a selective oxidizer output, because the water composition is the same regardless of the source. It is within the level of ordinary skill in the art to recycle in a known process.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to process any feed applicable to a fuel cell according to the process of Setzer et al (3,485,746) , including applicants' specific gaseous feeds because the reference of Setzer et al.(3,485,746) does not limit the specific hydrocarbon feeds. In the absence of unexpected results, any hydrocarbon fuel suitable for use in a fuel cell would be expected to be suitable for treatment in the Setzer et al.(3,485,746) process.

Claims 9-11 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Setzer et al.(3,485,746) in view of Alexander et al.(6,103,103).

See teachings of Setzer et al.(3,485,746) and statements of obviousness above.

Several additional differences are noted between the reference of Setzer et al.(3,485,746) and applicants' claimed invention. Setzer et al.(3,485,746) does not disclose alcohol or ether oxygenates. It is also noted that the reference of Setzer et al.(3,485,746) does not disclose the production of isobutylene and methanol products.

The reference of Alexander et al.(6,103,103) is cited to show that conventional gasoline marketed in large metropolitan areas contains oxygenates including, methanol, ethanol and MTBE (methyl tertiary butyl ether). See column 1, lines 1-25. Such compounds are known to have high blending octanes. See column 1, lines 26-28.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to treat a fuel containing oxygenates such as methanol, ethanol or MTBE (methyl tertiary butyl ether) according to the Setzer et al.(3,485,746) because Alexander et al.(6,103,103) illustrates that it is conventional for such fuels to contain oxygenates which are known to desirably have high blending octanes. Motivation to include oxygenates in the fuel is derived from the fact that such oxygenate additives have high blending octanes (note: high octane indicates a high resistance to undesirable knock). One of ordinary skill desiring to reduce knock would add such oxygenates to fuel which are known to improve octane. In addition, applicants' methanol/isobutylene production limitations are not considered to be patentable distinctions because the formation of isobutylene or methanol would naturally result from processing a feed containing the oxygenates of Alexander et al.(6,103,103) over the nickel catalyst of Setzer et al.(3,485,746).

(11) Response to Argument

The argument that the disclosure of Setzer et al. does not encompass applicants' "no more than about 0.05 ppm sulfur" is not persuasive. It is maintained that the reference's disclosure of "amounts below those amounts detectable" encompasses applicants' 0.05 ppm. Applicants' sulfur amounts are considered to overlap those disclosed by Setzer et al. (See previous arguments of record). Applicants' have not pointed to any difference in the process of Setzer et al. that would produce a level of desulfurization different from that claimed by applicants.

The argument that the detector in Setzer et al would not be able to detect amounts of sulfur between 0.05m and 20 ppm is not persuasive. Regardless of whether or not the detector of

Setzer is able to detect sulfur of less than 20 ppm (e.g., 0.05 ppm), the examiner maintains that it is within the level of ordinary skill to practice a known desulfurization process to attain a desired level of desulfurization with today's technology.

The argument that it is not obvious to modify the process of Setzer et al. to operate at a temperature of from 300 to 450° C is not persuasive. From Fig. 2, one would learn that the process of Setzer et al. would be operable at a low temperature such as 450° C and at such temperature, it would be expected that the breakthrough time would be less. This may result in more frequent catalyst regenerating. However, operating at lower temperature would not affect the overall removal of sulfur in the process. Therefore, the examiner maintains that one of ordinary skill would be motivated to select a specific elevated temperature which accomplishes a desired level of desulfurization, such as the specific temperature claimed by applicants because it would be expected that the results would be the same or similar when operating the process of Setzer at either 500 or 450° F.

The argument that Setzer does not provide motivation or suggestion that a selective oxidizer effluent could be used as a source of both water and hydrogen for the desulfurization process and does not suggest the use of a fuel cell power plant selective oxidizer recycle as an additive to a fuel stream is not persuasive. Recycling components for reuse in chemical processes is known. Therefore, the examiner states that it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Setzer by recycling the oxidizer for reuse in the claimed amount because the recycling step would cut down the cost of fresh oxidizer and it would be expected that where water comes from would not affect the outcome of the process. It is also expected that the results would be the same or similar

when recycling 10 % or 11% of the total oxidizer output because the composition in the recycled water would be the same as fresh water.

The argument that Setzer does not suggest any of the fuels recited in Claim 23 is not persuasive because Setzer does not limit the fuel feedstock. Therefore, one of skill in the art would use any fuel which can be used in a fuel cell including the fuel stock having low sulfur content as claimed and it would be expected that the results would be the same or similar when using the claimed fuel because of the similarities between the claimed fuel and the Setzer fuel.

The argument that the Alexander reference teaches away from the use of an organic additive in gasoline is not persuasive because. Applicants are relying on different portions of Alexander et al. than those relied on in the rejection above to destroy the combination of references. It is maintained that the secondary reference of Alexander was relied on for the teaching in its prior art section that oxygenates are known fuel additives (e.g. enhancers). The fact that the secondary reference teaches an alternative to such enhancers does not negate the general teaching that such oxygenate additives are known. One of ordinary skill in the art would be motivated to add applicants' claimed oxygenates to the fuel of Setzer et al.(4,485,746) because such oxygenates are known to improve fuel octane as evidenced by the secondary reference. Motivation to add applicants' claimed oxygenates is derived from the desire to obtain the known benefits of such additives (e.g. a high octane fuel). Consequently, the added oxygenates would be converted to other compounds as claimed (e.g., claims 10 and 11) because of the similarities of the claimed process and the modified process of Setzer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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TN
March 5, 2004

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